ORAL HISTORY OF THE TENNESSEE VALLEY AUTHORITY
INTERVIEW WITH
NICHOLLS W. BOWDEN

BY - CHARLES W. CRAWFORD
ORAL HISTORY RESEARCH OFFICE
MEMPHIS STATE UNIVERSITY

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INTERVIEW WITH NICHOLLS W. BOWDEN

DECEMBER 10, 1969

BY CHARLES W. CRAWFORD

ORAL HISTORY RESEARCH OFFICE

MEMPHIS STATE UNIVERSITY

BOWDEN, NICHOLAS W.

MEMPHIS STATE UNIVERSITY

ORAL HISTORY RESEARCH OFFICE

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PLACE Jackson, Mississippi

DATE March 27, 1974

Mrs. Elizabeth B. Millice
(Interviewee)
(For Mr. Nichols Bowden, Deceased).

Charles Crawford
(For the Mississippi Valley Archives
of the John Willard Brister Library
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(OHRO Form B)

THIS IS MEMPHIS STATE UNIVERSITY ORAL HISTORY RESEARCH OFFICE PROJECT. AN ORAL HISTORY OF THE TENNESSEE VALLEY AUTHORITY. THE DATE IS DECEMBER 10, 1969. THE PLACE IS KNOXVILLE, TENNESSEE, THE TVA BUILDING. THE INTERVIEW IS WITH MR. NICHOLLS W. BOWDEN, FORMERLY WITH THE TENNESSEE VALLEY AUTHORITY, PRESENTLY RETIRED AND LIVING IN KNOXVILLE. THE INTERVIEWER IS DR. CHARLES W. CRAWFORD OF MEMPHIS.

DR. CRAWFORD: Mr. Bowden, I suggest that we start this record by dealing with the matters concerning your early life, education, and your experience, which I know is rather extensive, before becoming associated with TVA. Then after we have covered this ground, let's proceed to your experiences with the Authority.

MR. BOWDEN: Well, I'm a native of Louisiana and a graduate of Louisiana State University with a Bachelor of Science degree in 1908. In 1928, I received the Civil Engineering degree from the same university. Upon graduation from the University, my first work was in 1908 with the U. S. Corps of Engineers in a survey of the Tennessee

MR. BOWDEN: (Cont'd) River, between Decatur, Alabama and Florence, Alabama, the survey being connected with the proposed building of Wilson Dam, which was subsequently built.

An interesting experience in connection with that was that at that time malaria was epidemic in the Valley. In that particular area, much of which was swampy, in northern Alabama, many people suffered from malaria every year. Our original survey party consisted of 27 young engineers largely from universities in the region. I happened to be the last one reporting for duty. Before the work finished, all of the engineers had become ill with malaria. Since I arrived last, I was attacked last. But I was able to finish the survey and take the notes to Nashville and assist in preparing the maps from the survey. I mention this for the reason that TVA has done so much in subsequent years to eliminate malaria from the region. Some people in the area at that time warned us in the survey not to eat the big muscadines, which were abundant there in the summer. If we did we would surely have malaria. At that time the Panama Canal Study showing

MR. BOWDEN: (Cont'd) that the mosquito transmitted malaria was not available.

DR. CRAWFORD: Did you get malaria at that time, Mr. Bowden?

MR. BOWDEN: Yes, it developed later in Nashville. It must have lasted for about a year. I was able to finish the survey work, although others--the Chief of the party and all the rest of them--one by one had become ill. After that I spent fourteen years in Tennessee River improvement work, at that time for navigation solely. Hale's Bar Dam was under construction and was subsequently completed in 1913, I believe. The Wilson Dam was begun in the teens in connection with World War I effort, and was completed in the early twenties, as I recall. During the fourteen years on the Tennessee River my work was connected largely with dredging and dike construction to improve the channels for steam boat navigation.

However, there were two canals on the river. Muscle Shoals and the Riverton canals around some great shoal obstructions in the

MR. BOWDEN: (Cont'd) river which boats were unable to navigate. My work also included the operation and care of those navigation features.

DR. CRAWFORD: Were you sure at the time that Wilson Dam would be completed and the Muscle Shoals canal be unnecessary?

MR. BOWDEN: Yes. When World War I began and the officers of the Corps of Engineers were used largely in the war effort, I was placed in charge of the engineer office in Chattanooga, which was a sub-office of the main office in Nashville. I mention this for the reason that this office was taken over in 1920 or '21 by Colonel Harold C. Fisk who had been overseas during the war. And he at that time initiated the well-known Tennessee River Survey, House Document No. 328 report, made by the Corps of Engineers and completed in 1928, I believe. Colonel Fisk relieved me of the duties of that office, and in 1922 I left the river work for some seven years, and engaged in highway work in Louisiana where I became State Highway Engineer. From there in 1928 I

MR. BOWDEN: (Cont'd) went to the Pittsburgh Office of the Corps of Engineers on improvement work on the upper Ohio River and tributaries, with headquarters in Pittsburgh, Pennsylvania. My duties there were in charge of the Project Division, which located and planned navigation and flood control projects, and made the first aerial river surveys, including those for the proposed Lake Erie-Ohio River Canal and flood control reservoir sites in the valleys. I also made periodic visits to Washington, D. C. to do consulting work for U. S. Committees. On January 16, 1936, I was delighted to return to the Tennessee Valley and engage in work connected with the improvement of the Tennessee River, while continuing the Washington assignment.

DR. CRAWFORD: Why did you decide to return to the Tennessee Valley?

MR. BOWDEN: Well, there were two principal reasons, I suppose: One was the great interest that I acquired in the Valley while here fourteen years, and I married in the Valley while I

MR. BOWDEN: (Cont'd) was here. Those two things, I suppose.

DR. CRAWFORD: Had you followed the development of TVA from the beginning?

MR. BOWDEN: Yes, I had.

DR. CRAWFORD: Did the engineering aspects of it interest you?

MR. BOWDEN: Yes, and especially the controversial features. I may mention here that I heard in the early 1930's, before TVA had adopted its method of operating the reservoirs, an eminent civil engineer in a lecture state that it was impractical to build reservoirs for the joint purposes of flood control and power for the reason that flood control required the reservoirs to be empty, so as to store the flood waters, and power required them to be full in order to get the most power. At that time this was quite a controversial subject. I knew that TVA was working along the lines of multiple purpose dams and reservoirs. That interested me, of course.

DR. CRAWFORD: Did you have an opinion about it? Whether multiple purpose reservoirs would be practical?

MR. BOWDEN: Not at that time, but I did later when I came back and became interested. After a few months report work, by chance I suppose, I was assigned to make studies--to assist in making studies--of the reservoirs that were being contemplated in the Valley, especially the method of operating them. My initial work with TVA was under the supervision of Sherman M. Woodward, who was one of the most eminent engineers engaged by the TVA. He had been a professor at the University of Iowa for many years, also, in consulting work for the Government in Washington D. C. and on the Miami Conservancy District work in Ohio, and was in my opinion, a brilliant engineer.

My first work with him was in the preparation of the TVA report to the Congress on the Unified Development of the Tennessee River System which was completed on March 31, 1936. After that, the studies and somewhat varied hydraulic work began.

DR. CRAWFORD: Before we go to your later work, could you tell something about your work on the Unified Report, Mr. Bowden--the circumstances of getting it together, and who worked on it?

MR. BOWDEN: My duty in connection with that report was that of bringing various parts together. The various divisions of TVA prepared the several parts of the report. They were edited and reviewed by the engineers and by the Board members of TVA. It was printed in Chattanooga and transmitted to Washington in compliance with the requirements of law, that it reach Washington on the first of April, 1936.

DR. CRAWFORD: The date on which it was due. Did you have sufficient time to get this report prepared?

MR. BOWDEN: Yes, we had from January 16 to the end of March. Of course, that wasn't a lot of time, but we had many people working on it, which, of course, helped, but at the same time made necessary a lot of coordination.

DR. CRAWFORD: After getting the Unified Report out of the way, then what was your next work?

MR. BOWDEN: At that time the Norris Reservoir was still under construction. It was the first reservoir completed by TVA, and it was necessary to complete plans for its operation. In TVA, we had many engineers from all parts of the country, skilled in various phases of engineering work. They came from power companies, from universities and colleges, from other engineering organizations, and, at that time, during the Great Depression, it was possible for TVA to screen the engineers very carefully and to secure the type of men who normally would not have been available. Such men as these were available to prepare studies and plans for the operation of the reservoirs. There the ideas varied, of course. Especially when we consider that that old idea of full reservoirs for power and empty reservoirs for flood control prevailed. The studies were extensive, going into rainfall and run-off in the Valley of record, with a view of determining the method of operating

MR. BOWDEN: (Cont'd)

Norris Reservoir and later other reservoirs as they were built.

As a result of these studies made jointly by several engineers and, of course, much pencil work, curves were developed--rule or guide curves--for the operation of the reservoirs as they were fitted into the growing system, Norris first, of course.

TVA was unique in this, as it was, in its creation as an agency of the government to develop the multiple purpose water resources of the entire basin, including the power feature. That it has been successful as attested by results achieved and by the acclaim at home and abroad, hardly need be said.

Nevertheless, as is usually, if not invariably true with successful organizations, it has had difficulties to overcome from without, as in the attacks on the power development feature of its operations, and in other attacks from without. These have been overcome as the operation of the system successfully became more and more evident with additions of more reservoirs to the system and the successful

MR. BOWDEN: (Cont'd) operating results. My experience with TVA extended from January, 1936 until retirement at the end of March, 1958. During this period, some thirty floods in the river were regulated with the savings in flood damages at Chattanooga alone estimated at more than one hundred million dollars. The reservoirs were operated in such a manner as to combine this flood control with power, following the rule curves prepared, without doing violence to either.

DR. CRAWFORD: Did the TVA experiment prove the usefulness of multi-purpose dams? Did it put an end to that engineering question of whether or not they were profitable?

MR. BOWDEN: The answer to that, I think, is that TVA and the TVA's plan has become favorably known not only throughout the United States, but in most foreign countries. And the procedure for operating reservoirs has been influenced by the TVA experience although I think not yet universally adopted. I don't know whether that's clear or not.

DR. CRAWFORD: Has the TVA system been studied extensively by engineers from other countries?

MR. BOWDEN: Yes, by many. There is hardly a country that you could mention that hasn't had engineers here studying TVA.

DR. CRAWFORD: Do you think it had influenced dam building and engineering projects in other countries?

MR. BOWDEN: Certainly. Although I wouldn't say that TVA's plans have been followed in detail.

DR. CRAWFORD: Did you deal with any foreign engineers when they were in this country?

MR. BOWDEN: Yes, I had interviews with many of them. Many of them came to my office and inquired in detail as to the method of operation, what the results were.

DR. CRAWFORD: Were you able to communicate with them well? Do engineers speak the same--deal with the same facts--in any country?

MR. BOWDEN: I didn't get that.

DR. CRAWFORD: Do engineers deal with essentially the same facts regardless of their country?

MR. BOWDEN: Yes, I should think that that would be answered as yes. Of course, they have different ideas, but they have the same problems to face with the addition of the irrigation problem, which we don't have in the Tennessee Valley.

DR. CRAWFORD: Mr. Bowden, it seems to me that you have assembled a very remarkable group of engineers, many of them eminent in their fields and with a good deal of experience before coming to TVA. How did this system work together? What problems of organization and operation did you experience?

MR. BOWDEN: Well, of course, at first organizational problems were experienced. There was some duplication of efforts, and more importantly, the much more difficult question of the place of power in the program arose, both at the managerial policy-making level and at the

MR. BOWDEN: (Cont'd) planning and reservoir operation levels.

DR. CRAWFORD: Did the fact that you had the engineering group divided--some of the people working in Chattanooga and some in Knoxville--cause difficulty?

MR. BOWDEN: In Knoxville the operation of the reservoirs was determined, to carry out the provisions of the rule curves, and each day, or as often as was necessary, the instructions for the operation of the dams to secure the desired reservoir operations were transmitted by telephone or teletype and confirmed in writing. There the power operating people saw that the instructions were transmitted to the dams and carried out.

DR. CRAWFORD: Did you have any conflict of functions between reservoir control or management and the power program?

MR. BOWDEN: I think it was inevitable that we would have differences of opinion and in some cases conferences by telephone or otherwise were

MR. BOWDEN: (Cont'd) necessary. However, in the main, the Knoxville operating plans were carried out so that the desired results were obtained.

DR. CRAWFORD: Were you generally satisfied, then, with the work of the reservoir management? Did you have special problems?

MR. BOWDEN: It has been successful. There is no doubt. But I think that it would have been preferable to have had all of the operations conducted from one source. And not to have had dual responsibilities.

DR. CRAWFORD: Why was the power management placed in Chattanooga?

MR. BOWDEN: I would not know the answer to that. That was a managerial problem. It may have been due to the fact that it was a more central location in the Valley and the contacts between the Chattanooga power office and the dams up and down the River and in the tributaries were easier to carry out.

DR. CRAWFORD: Do you feel that there would have been an advantage in having the headquarters located at Muscle Shoals?

MR. BOWDEN: I suppose that question is one which has been raised many times, and it certainly is subject to a lot of argument and controversy. Essentially, I believe that the final solution, due to the cooperation of all concerned, has resulted in quite effective results.

DR. CRAWFORD: Did you have overlapping of work of the engineers in the early days of TVA? I know that you had many capable engineers then, and you didn't have things organized in the beginning that had to be done after TVA started.

MR. BOWDEN: Yes, the various branches of the TVA often, when questions arose as to water problems, would prepare and make their own studies and prepare their own answers. It would sometimes be found that other branches in pursuance of their work had done the same thing, or something so nearly the same

MR. BOWDEN: (Cont'd) that it might have been done only once. However, I think that that would always be true of any new organization, especially one with such highly qualified people.

DR. CRAWFORD: How was this work finally coordinated? Did Colonel Parker manage that?

MR. BOWDEN: Well, all of the management of it came under the Chief Engineer, of course. By the time I left the TVA, and even before, the work had been coordinated to such an extent that there appeared to be very little duplication of work.

DR. CRAWFORD: When was that accomplished? Was that accomplished under Colonel Parker or Clarence Blee?

MR. BOWDEN: I think it was gradually accomplished all along until it probably has been finally eliminated. I don't think any one person did it.

DR. CRAWFORD: Did it seem to you there was a good deal of experimentation in the organization

DR. CRAWFORD: (Cont'd) of TVA? Trying different things to see how they worked?

MR. BOWDEN: I know that TVA started with a three-man Board, later a coordinator was brought in, Mr. Jack Blandford. Later the General Manager's office was established.

DR. CRAWFORD: Was that true also in the engineering organization?

MR. BOWDEN: Well, I think in all the organizations that was true. Of course, my knowledge is specifically in water control planning, where to some extent that was true. But I believe it was less true there than perhaps in some of the other departments, although I can't speak definitely as to that.

DR. CRAWFORD: Did you have to experiment some in your own operation, Mr. Bowden? Did you have to rearrange things until you had them fixed the way you wanted them?

MR. BOWDEN: I think the answer to that would have to be yes, because I don't think that we

MR. BOWDEN: (Cont'd) had any special halo or attribute. We tried, of course, from the very first to coordinate all of our work. But I'm sure that we profited by some of our mistakes.

DR. CRAWFORD: What did most of the engineers have in common? Had most of them had a similar background, or education? Had most been in hydraulics? Had most of them worked for the same companies? Were there any common features?

MR. BOWDEN: So far as the engineering branch of the water control planning department was concerned, the engineers had varied backgrounds, as indicated earlier. Later, some with power--hydro-electric energy production and generation--transferred to the power department. The water control planning department retained those who had largely flood control, navigation, and experience of that nature, and some with power experience.

DR. CRAWFORD: What did your duties consist of mainly, Mr. Bowden, after the dams were completed

DR. CRAWFORD: (Cont'd) and things were turned over to you?

MR. BOWDEN: My duties then were to supervise, as chief of the River Control Branch, an organization of some fifteen engineers. We received daily from the Hydraulic Data Branch of the Authority and from the power department in Chattanooga, detailed information as to rainfall and stream stages, so that we could determine the proper operation of the reservoirs in the succeeding periods.

We also dealt with the U. S. Weather Bureau under an agreement whereby that government organization gave TVA--gave us--detailed quantitative amounts and forecasts of rainfall so that we could not only determine how to retain or release water from the various reservoirs as of the present moment, but for the next few days in advance. Each day we would get these forecasts and would revise our operations accordingly and transmit the information--the instructions--to the power people in Chattanooga for execution.

DR. CRAWFORD: And did you release the water then, in as regular and even a manner as you could to keep capacity for flood control and produce power at the same time?

MR. BOWDEN: Our main purpose was flood control--and navigation--and the operation of the reservoirs was determined so as to insure that the required amount of flood control would be had, taking into account the rainfall and run-off conditions.

DR. CRAWFORD: Did that continue to be the main purpose of TVA? Primary flood control throughout all the time you were with TVA?

MR. BOWDEN: Yes. Power development was subordinate.

DR. CRAWFORD: Did you have any part in the development of the steam plant system in World War II and afterwards?

MR. BOWDEN: None. That was handled by other departments of TVA. The construction of

MR. BOWDEN: (Cont'd) steam plants came in the latter part of the period in which I was with TVA, and largely since I left TVA.

DR. CRAWFORD: Do you not feel that World War II changed the purpose of TVA particularly?

MR. BOWDEN: Well, World War II had its effect on TVA. For one thing, the construction of certain reservoirs was hurried up at that time so that the power would be available. At that time I don't believe the steam plant construction had advanced enough to be a large factor. However, that's not my particular field. But the war did speed up TVA's construction operations so that more power would be available in the reservoirs.

DR. CRAWFORD: Did you feel when you eventually left TVA, Mr. Bowden, that the flood control program was sufficient to control any foreseeable floods?

MR. BOWDEN: Well, it depends on what you call control. The word control to me usually implies

MR. BOWDEN: (Cont'd) complete mastery. That is not true. TVA is able to regulate (reduce height of) all floods under its plan of operation of the system of reservoirs now consisting of some thirty-odd reservoirs, including those of the Aluminum Company of America in the Little Tennessee River basin which the TVA supervises.

DR. CRAWFORD: Did any cities face particular flood problems? Chattanooga or any others yet?

MR. BOWDEN: Chattanooga was the main point of damage in the Valley due to its relatively low-lying areas and the large development of that low-lying area. For example, in the second greatest flood in history in its natural, un-regulated condition, on February 2, 1957, at Chattanooga, was reduced from what would have been a stage of 54 feet at Chattanooga to a stage of 32.2 feet, or a reduction of 21.8 feet, with an estimated prevention of damages of approximately $66,000,000.00 at that time--probably twice that amount based on present conditions and value of the dollar. The

MR. BOWDEN: (Cont'd) actual damages were estimated at $20,000.00.

DR. CRAWFORD: You feel then that the flood control effect of TVA has been successful?

MR. BOWDEN: Highly successful!

DR. CRAWFORD: Then your part in TVA has certainly been one of the successful parts, Mr. Bowden.

MR. BOWDEN: Well, we all would like to think that, but I am sure the records will bear out that every major flood in the Valley has been regulated in such a way as to effect savings in damages. Not only in Chattanooga, but elsewhere in the valley, and the contribution to flood height reduction on lower Ohio and Mississippi Rivers has been extensive. In other words, the discharge of flood waters from the Tennessee River in the operation of the reservoirs has been such that the peak discharge from the Tennessee River was not allowed to coincide with the peak discharges in the Ohio and the Mississippi.

DR. CRAWFORD: Then you took that into consideration in your release of water as well as the factors within the Valley itself?

MR. BOWDEN: Yes, this is required by the TVA and subsequent Act of the Congress. Regulation of Tennessee River flows into the Ohio River resulted in reducing flood heights at Cairo on the Mississippi by as much as two to three feet.

DR. CRAWFORD: Did you experience any particularly difficult times in your career with TVA, Mr. Bowden? Did you have any difficulty carrying out your work at any specific time? The Congressional Investigation, the 1950's, or any other time?

MR. BOWDEN: No, I was not personally involved in any of the investigations, if that's what you have in mind. I was not called to testify.

DR. CRAWFORD: Did you feel that Congressional appropriations were generally sufficient to carry out your work the way you wanted to?

MR. BOWDEN: I don't think anybody ever has enough money, but I think generally speaking the answer to that should be yes. I presume you mean my specific part of the work.

DR. CRAWFORD: Yes, sir.

MR. BOWDEN: We would all like to have had some improvements made. For example, we operated eight hours a day in our reservoir operations. And of course it rained most any time during the 24 hours in a day. In other words, there were sixteen hours in which we were not supposed to be present and working. But many, many times our operating force, including myself, has been at the office receiving flood reports, rainfall reports, river stage reports, and weather forecasts, and sending revised operating instructions to the power people in Chattanooga into the wee hours of the morning. One time I recall I didn't leave the office until about 3 o'clock in the morning, after having been there all day. I thought at that time, and I still am inclined to believe, that we might have had a better arrangement with two shifts, or even

MR. BOWDEN: (Cont'd) three shifts. However, that, of course, introduces questions of cost. I found that our personnel in time of flood were so dedicated that they had no objection to staying all night if necessary--as long as it was necessary to stay there and work.

DR. CRAWFORD: In what season of the year did you normally have most flood trouble?

MR. BOWDEN: Well, from about December 15 to April 1 is the flood season. During the rest of the year we were able to lower the reservoirs by releasing the water, which we had stored in connection with the flood operations in those three or four months in the winter, and using it for navigation and power.

DR. CRAWFORD: And still keep sufficient water for power?

MR. BOWDEN: Yes, as we released the water gradually it was used for power. During a flood we normally released some water to effect the best operation of the flood, because otherwise continuing rain might produce more

MR. BOWDEN: (Cont'd) water than we could contain. Water almost invariably was being released at some or all of the dams. Not nearly so much, perhaps, as was coming in. Or, sometimes we would need to release water from storage to make room for flood water from upstream areas. Those were just detailed problems, peculiar to the specific flood and never the same, which had to be solved.

DR. CRAWFORD: You had a rather complicated work, didn't you, as the number of reservoirs in the Valley increased?

MR. BOWDEN: Well, that question makes it a little embarrassing for me to answer, but I would say that our multiple-purpose operations were developed without any past experience of that kind of operation--multiple-purpose operation. And without any suitable engineering textbooks on the subject. In other words, TVA developed a plan of operation of its own to meet the problem.

DR. CRAWFORD: Who did the planning for that, Mr. Bowden?

MR. BOWDEN: The engineers who were in the water control planning department and planned the operation of the reservoirs.

DR. CRAWFORD: Yes.

MR. BOWDEN: It's hard to go back to all of the details, but we had many months of study and discussion as to how this reservoir or that should be operated during the full range of the year, how full it could be at every period in the year, how far it needed to have gone down by the end of the year to be ready for the control of floods, or regulation of floods, during the winter season; then how to release that water during the summer and fall so as to return the reservoirs to flood control levels--required flood control levels--by January 1. And at the same time use that water in such a way as to produce the greatest amount of power.

DR. CRAWFORD: Then you helped to develop a rather new branch of engineering, didn't you?

MR. BOWDEN: Well, as I said, this is rather embarrassing for me to answer, but I can be specific to this extent: There were three of us--three branch heads: the flood control branch head, the power planning branch head, and the river control branch head. Each supervised in their respective branches the studies and submitted the rule or guide curves that were prepared for approval and their initials appear on the curves that are still in use. I wish I had one of them for you. That doesn't mean that each one of the branch heads individually did all the spade work.

DR. CRAWFORD: I know you had a staff doing some of the work, did you not?

MR. BOWDEN: That's right, but each one of us went into the problem and the three of us agreed on the proper method of operating that rerervoir in conjunction with the other reservoirs in the system. Each new reservoir had a curve for that particular reservoir prepared for its operation so as to fit into the other reservoirs in the system.

MR. BOWDEN: (Cont'd) Before that curve became official and was published, each one of us initialed it as meeting our views and then it went to the department head and Chief Engineer for approval and signatures. I hope that answers your question.

DR. CRAWFORD: Yes. Did you generally have a good staff of engineers working for you? Were you satisfied with the quality of the personnel you had in TVA?

MR. BOWDEN: I don't think we could have had better-qualified engineers than I had in the River Control Branch. Now, that doesn't mean that every one in the branch were experienced. Most of them were bright young college men, but there were three or four without whom I don't think we would ever have had successful operation of our reservoirs. I would be delighted, if proper, to mention some of their names. One of them, upon my retirement, took my place, and upon his death, another took his place, and both maintained and improved the high standard of operations.

DR. CRAWFORD: What were their names, sir?

MR. BOWDEN: My principal assistant was Mr. J. H. Wilkinson, deceased. Then the late Mr. Leroy R. Engstrom succeeded me. The third is now Chief of the River Control Branch, Mr. Alfred J. Cooper, Jr. All were excellent engineers and all were in the branch when I was its Chief. Without them we could never have succeeded.

DR. CRAWFORD: You were fortunate to have a good staff. Was it helpful to the engineering flood control aspects of TVA to have a hydraulic engineer on the Board?

MR. BOWDEN: Oh, I think so, yes. I think the original set-up of the Board theoretically was excellent with a hydraulic engineer, a power engineer or manager, (expert) and the third, an educator, expert in agriculture. I think the set-up of the Board was most excellent. They were all strong men.

DR. CRAWFORD: It was divided, then, among the major

DR. CRAWFORD: (Cont'd) aspects of TVA, at the beginning?

MR. BOWDEN: I don't know to what extent the various heads handled various aspects. I wouldn't know that. But they certainly had the ability there.

DR. CRAWFORD: Sometimes it's difficult for people with a great deal of ability to work together harmoniously.

MR. BOWDEN: Well, I suspect some would say that was borne out by the experiences in TVA. I don't say so, but I think that perhaps the record indicates that there was some of that. But I don't think to the long-time hurt. I think those original three Board members did the managerial, policy making ground work, the spade work, for TVA. And TVA is successful today.

DR. CRAWFORD: They were all very strong and very capable managers. Did you report directly to the General Manager after the office was established in your work?

MR. BOWDEN: No, I reported to the Water Control Planning Department Head, Mr. Woodward. There never was a finer man or a greater engineer.

DR. CRAWFORD: What happened to him?

MR. BOWDEN: He later became a consultant to TVA upon his retirement as Head of the Department. He wasn't able to do regular work, full-time. Then later, some sixteen years ago, he died. I think he should be called one of the fathers of TVA. His judgment was relied on heavily. I happen to know that because I was close to him, working for him, under him. I often had to go to Board members at his request on some matter that came up. He would ask me to go in his place, so I know that his judgment was valued highly by those Board members.

Yes, I think that our record was excellent along that line. I think the record will show that the various floods of any damaging magnitude were regulated after the reservoirs became available for that purpose. And in no case was a failure

MR. BOWDEN: (Cont'd) made in regulating a flood. Always an effort was made to reduce the flood as much as possible with the facilities then available.

DR. CRAWFORD: Has that effort continued in similar manner since your retirement?

MR. BOWDEN: The records say so. I can't pass upon that. The records indicate that it has been equally successful since I left. That was due to such men as I mentioned above in the River Control Branch, who just were so well-qualified, and they had come up in the detail work of it, too. They were graduate engineers. Graduate civil engineers. They did the spade work for the operations which were entirely successful.

DR. CRAWFORD: Can you tell something about your activities since your retirement, Mr. Bowden?

MR. BOWDEN: Upon retiring I did some engineering consulting work for a while, and since then I've just "played," so to speak. I've had personal interests and I have had civic

MR. BOWDEN: (Cont'd) interests. I am a member of the Technical Society of Knoxville. I was its President one year, and, a thing in which I have been deeply interested for the last eleven years, ever since my retirement, is United Fund work, recruiting each year and heading, you might say, the work of some twenty-odd retired people. Most of these are TVA engineers who have retired, and we audit the report records, cards, at the United Fund weekly meetings in the fall--each fall. That has been a very rewarding experience. It carries with it, of course, some sad things. Each year we have to recruit one or more new men to replace those either unable to come or deceased meanwhile, and so on. But those men, most of them TVA engineers, retired, just seem to take delight in meeting and working on those records--under the supervision of Certified Public Accountants, of course, to whom we pass our work after we do the audit.

DR. CRAWFORD: You certainly remain busy, Mr. Bowden, and I thank you very much for the valuable

DR. CRAWFORD: (Cont'd) contribution to the record of the development of TVA, the experiences of your life and your career with the Authority.

MR. BOWDEN: Well, it's been a pleasure, but I hope that I haven't appeared in any degree egotistical in any of the statements that I have made. I tried not to be, because TVA's success, such as it's had, has been due, I think, to the team work of the employees from the highest to the lowest. I don't think it could have been done without dedication. You know, that is something in TVA that I've seldom found elsewhere. That's what I had in mind when I mentioned earlier that what I would have to say I would try to make objective and not just heap praise or fire condemnation. I would try to be objective.

DR. CRAWFORD: Yes, sir, I think that we have received some very objective information.

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